

DERWENT-ACC-NO: 1998-063065

DERWENT-WEEK: 200302

COPYRIGHT 1999 DERWENT INFORMATION LTD

TITLE: Solvate of lithium hexafluorophosphate and pyridine used  
as battery electrolyte - by forming pyridinium  
hexafluorophosphate and conversion to solvate by exchange  
with e.g. lithium hydroxide

INVENTOR: COUDERT, R; LEMORDANT, D ; NAEJUS, R ; WILLMANN, P

PATENT-ASSIGNEE: CENT NAT ETUD SPATIALES[CNES]

PRIORITY-DATA: 1996FR-0007623 (June 19, 1996)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
ES 2175431 T3	November 16, 2002	N/A	000	C07F 001/00
WO 9748709 A1	December 24, 1997	F	033	C07F 001/00
FR 2750126 A1	December 26, 1997	N/A	028	C01B 025/455
EP 859781 A1	August 26, 1998	F	000	C07F 001/00
US 5993767 A	November 30, 1999	N/A	000	C01B 025/10
EP 859781 B1	May 2, 2002	F	000	C07F 001/00
JP 2002514153 W	May 14, 2002	N/A	024	C01B 025/12
DE 69712305 E	June 6, 2002	N/A	000	C07F 001/00

DESIGNATED-STATES: CA JP US AT BE CH DE DK ES FI FR GB GR IE IT LU MC NL PT SE  
BE CH DE ES FR GB IT LI NL SE BE CH DE ES FR GB IT LI NL SE

APPLICATION-DATA:

PUB-NO	APPL-DESCRIPTOR	APPL-NO	APPL-DATE
ES 2175431T3	N/A	1997EP-0930551	June 18, 1997
ES 2175431T3	Based on	EP 859781	N/A
WO 9748709A1	N/A	1997WO-FR01097	June 18, 1997
FR 2750126A1	N/A	1996FR-0007623	June 19, 1996
EP 859781A1	N/A	1997EP-0930551	June 18, 1997
EP 859781A1	N/A	1997WO-FR01097	June 18, 1997
EP 859781A1	Based on	WO 9748709	N/A
US 5993767A	N/A	1997WO-FR01097	June 18, 1997
US 5993767A	N/A	1998US-0000232	January 23, 1998
US 5993767A	Based on	WO 9748709	N/A
EP 859781B1	N/A	1997EP-0930551	June 18, 1997
EP 859781B1	N/A	1997WO-FR01097	June 18, 1997
EP 859781B1	Based on	WO 9748709	N/A
JP2002514153W	N/A	1997WO-FR01097	June 18, 1997
JP2002514153W	N/A	1998JP-0502434	June 18, 1997

JP2002514153W	Based on	WO 9748709	N/A
DE 69712305E	N/A	1997DE-0612305	June 18, 1997
DE 69712305E	N/A	1997EP-0930551	June 18, 1997
DE 69712305E	N/A	1997WO-FR01097	June 18, 1997
DE 69712305E	Based on	EP 859781	N/A
DE 69712305E	Based on	WO 9748709	N/A

INT-CL (IPC): C01B007/19, C01B025/10, C01B025/12, C01B025/455, C01D015/00, C01D015/04, C07D213/16, C07D213/20, C07F001/00, C07F001/02, C07F009/28, H01M010/26

ABSTRACTED-PUB-NO: EP 859781B

#### BASIC-ABSTRACT:

A solvate of lithium hexafluorophosphate and pyridine of formula,  $\text{Li}(\text{C}_5\text{H}_5\text{N})\text{PF}_6$  its preparation and the preparation of  $\text{LiPF}_6$  from this compound are claimed.

USE - Lithium hexafluorophosphate is used as an electrolyte in lithium -carbon storage batteries, which have numerous applications particularly in electric vehicles and portable equipment such as telephones. The electrolyte comprises one or more organic solvents containing a soluble lithium salt.  $\text{LiPF}_6$  is favoured for its high solubility and conductivity, and for safety reasons.

ADVANTAGES - The production of  $\text{LiPF}_6$  of high purity required for this application is possible from cheap commercial products. The solvate, unlike  $\text{LiPF}_6$ , is stable at ambient temperature and on storage. It can readily be converted to  $\text{LiPF}_6$ .

ABSTRACTED-PUB-NO: US 5993767A

#### EQUIVALENT-ABSTRACTS:

A solvate of lithium hexafluorophosphate and pyridine of formula,  $\text{Li}(\text{C}_5\text{H}_5\text{N})\text{PF}_6$  its preparation and the preparation of  $\text{LiPF}_6$  from this compound are claimed.

USE - Lithium hexafluorophosphate is used as an electrolyte in lithium -carbon storage batteries, which have numerous applications particularly in electric vehicles and portable equipment such as telephones. The electrolyte comprises one or more organic solvents containing a soluble lithium salt.  $\text{LiPF}_6$  is favoured for its high solubility and conductivity, and for safety reasons.

ADVANTAGES - The production of  $\text{LiPF}_6$  of high purity required for this application is possible from cheap commercial products. The solvate, unlike  $\text{LiPF}_6$ , is stable at ambient temperature and on storage. It can readily be converted to  $\text{LiPF}_6$ .

A solvate of lithium hexafluorophosphate and pyridine of formula,  $\text{Li}(\text{C}_5\text{H}_5\text{N})\text{PF}_6$  its preparation and the preparation of  $\text{LiPF}_6$  from this compound are claimed.

USE - Lithium hexafluorophosphate is used as an electrolyte in lithium -carbon

storage batteries, which have numerous applications particularly in electric vehicles and portable equipment such as telephones. The electrolyte comprises one or more organic solvents containing a soluble lithium salt. LiPF<sub>6</sub> is favoured for its high solubility and conductivity, and for safety reasons.

ADVANTAGES - The production of LiPF<sub>6</sub> of high purity required for this application is possible from cheap commercial products. The solvate, unlike LiPF<sub>6</sub>, is stable at ambient temperature and on storage. It can readily be converted to LiPF<sub>6</sub>.

WO 9748709A

CHOSEN-DRAWING: Dwg.1/7

TITLE-TERMS: SOLVATION LITHIUM PYRIDINE BATTERY ELECTROLYTIC FORMING  
PYRIDINIUM  
CONVERT SOLVATION EXCHANGE LITHIUM HYDROXIDE

DERWENT-CLASS: E12 L03 X16

CPI-CODES: E31-K04; L03-E01C;

EPI-CODES: X16-A02A; X16-B01F1; X16-J02; X16-J08;

CHEMICAL-CODES:

Chemical Indexing M3 \*01\*

Fragmentation Code

A103 A940 A960 B215 B720 B752 B819 B831 C009 C100  
C710 C803 C804 C805 C806 C807 F000 F431 M280 M320  
M411 M510 M521 M530 M540 M630 M720 M903 M904 N511  
N513 Q454

Markush Compounds

199806-E9501-P

Chemical Indexing M3 \*02\*

Fragmentation Code

A103 A940 B115 B720 B752 B819 B831 C009 C100 C803  
C804 C805 C806 C807 M411 M720 M903 M904 N421 N511  
N513 Q454

Specific Compounds

10929P

UNLINKED-DERWENT-REGISTRY-NUMBERS: 0245S; 0270S ; 0916S ; 1513S ; 1714S

SECONDARY-ACC-NO:

CPI Secondary Accession Numbers: C1998-022073

PAT-NO: JP403285271A

DOCUMENT-IDENTIFIER: JP 03285271 A

TITLE: BATTERY

PUBN-DATE: December 16, 1991

INVENTOR-INFORMATION:

NAME

IWAKURA, CHIAKI

FUKUMOTO, YUKIO

FURUKAWA, SANEHIRO

NAKANE, IKUROU

ASSIGNEE-INFORMATION:

NAME

COUNTRY

SANYO ELECTRIC CO LTD

N/A

APPL-NO: JP02074442

APPL-DATE: March 23, 1990

INT-CL (IPC): H01M010/40

ABSTRACT:

**PURPOSE:** To improve the charge efficiency of lithium which is a negative electrode and improve the cycle characteristic of a battery by adding a pyridine having a specified composition or a derivative of pyridine into an electrolyte.

**CONSTITUTION:** A nonaqueous electrolytic secondary battery is formed of a negative electrode 4 having lithium or an alloy containing lithium as an active material, a positive electrode 6 having molybdenum dioxide, vanadium pentoxide, oxide or selenoid of niobium, manganese dioxide, cobalt dioxide, or compounds of these materials with lithium as an active material, and an electrolyte. A pyridine or a derivative of pyridine represented by the generation formula  $(R<SB>1</SB>-R<SB>5</SB>)$  represent hydrogen or alkyl groups is added into this electrolyte. Hence, a battery having extremely long charge/discharge cycle life can be obtained.

**COPYRIGHT:** (C)1991,JPO&Japio

DERWENT-ACC-NO: 1992-038081

DERWENT-WEEK: 199953

COPYRIGHT 1999 DERWENT INFORMATION LTD

TITLE: Non-aq. electrolyte sec. battery with excellent cycle life, etc. - has electrolyte contg. pyridine or its deriv. and thiourea or aldehyde cpd.

PATENT-ASSIGNEE: SANYO ELECTRIC CO[SAOL]

PRIORITY-DATA: 1990JP-0074442 (March 23, 1990)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
JP 03285271 A	December 16, 1991	N/A	006	N/A
JP 2975627 B2	November 10, 1999	N/A	006	H01M 010/40

APPLICATION-DATA:

PUB-NO	APPL-DESCRIPTOR	APPL-NO	APPL-DATE
JP 03285271A	N/A	1990JP-0074442	March 23, 1990
JP 2975627B2	N/A	1990JP-0074442	March 23, 1990
JP 2975627B2	Previous Publ.	JP 3285271	N/A

INT-CL (IPC): H01M010/40

ABSTRACTED-PUB-NO: JP 03285271A

BASIC-ABSTRACT:

The battery has a cathode contg. Li or Li alloy as cathode active component, an anode containing Mo dioxide, V pentoxide, Nb oxide, selenide, Mn dioxide, Co dioxide or a mixt. of the material and Li as anode active component, and electrolyte liquid. The improvement is that the electrolyte liq. contains pyridine or pyridine derivative (I), thiourea (II) or aldehyde (III) R1-R5 is H or alkyl group.

(I) is e.g. dimethyl pyridine, trimethyl pyridine, methyl pyridine, ethyl pyridine, diethyl pyridine, methyl ethyl pyridine or dimethyl ethyl pyridine etc. Aldehyde (III) is e.g. p-anisaldehyde. The electrolyte solution contains a solvent selected from propylene carbonate, ethylene carbonate, 2-methyl-tetrahydrofuran or dimethoxyethane etc.

USE/ADVANTAGE - Excellent charging efficiency and cycle life.

CHOSEN-DRAWING: Dwg.1/5

TITLE-TERMS: NON AQUEOUS ELECTROLYTIC SEC BATTERY CYCLE LIFE  
ELECTROLYTIC  
CONTAIN PYRIDINE DERIVATIVE THIOUREA ALDEHYDE COMPOUND

DERWENT-CLASS: E19 L03 X16

CPI-CODES: E07-D04C; E10-A13A; E10-D01D; E10-E02D2; E10-F02A2; L03-E01C;  
L03-E03;

EPI-CODES: X16-B01F1; X16-J02; X16-J08;

CHEMICAL-CODES:

Chemical Indexing M3 \*01\*

Fragmentation Code

F000 F012 F013 F014 F015 F016 F431 M210 M211 M212  
M213 M214 M215 M231 M232 M233 M240 M280 M281 M282  
M283 M320 M413 M510 M521 M530 M540 M781 M903 M904  
Q454 R023

Markush Compounds

199205-D5501-U

Chemical Indexing M3 \*02\*

Fragmentation Code

G011 G012 G013 G100 H401 H441 H541 H8 J431 J581  
M210 M211 M212 M213 M214 M215 M231 M232 M233 M262  
M272 M280 M281 M320 M414 M510 M520 M531 M540 M781  
M903 M904 Q454 R023

Markush Compounds

199205-D5502-U

Chemical Indexing M3 \*03\*

Fragmentation Code

K0 L4 L420 M280 M320 M416 M620 M781 M903 M904  
M910 Q454 R023

Specific Compounds

00235U

UNLINKED-DERWENT-REGISTRY-NUMBERS: 0235U

SECONDARY-ACC-NO:

CPI Secondary Accession Numbers: C1992-016781

Non-CPI Secondary Accession Numbers: N1992-029091